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ABSTRACT

The evolution and implementation of a collaborative effort between an elementary school bilingual science education project (Process in Science Methods, or PRISM) of The Network, Inc., and a study of the educational effectiveness of community arts centers (Project Co-Arts) are described. With PRISM's focus on science and Co-Arts' concentration on the arts, the two projects may seem unlikely collaborators. Nonetheless, they have been successfully linked because of their shared perspectives on two concepts: (1) process-based education and assessment, and (2) the methodology of "portraiture" to develop an authentic interpretive description of programs. Project Co-Arts developed a process-based model for assessing educational effectiveness, focusing on four program dimensions: teaching and learning (pedagogy); journey (history and future vision); community; and administration. Portraiture, a group process methodology for interpretive description of an educational scenario, was used to document the PRISM program. The process and nature of the collaborative effort are detailed. Appended materials include graphic representations of the Co-Arts assessment model and its application to the PRISM program, in both English and Spanish, and two memos concerning the assessment implementation. Contains six references. (MSE)

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Partners in Portraiture: An Account of the Collaborative Work of Projects PRISM and Co-Arts

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Introduction

In this paper, the authors describe the evolution and implementation of a collaborative effort involving two projects, PRISM at The NETWORK Inc., and Co-Arts at the Harvard Graduate School of Education's Project Zero. Project PRISM is an inquiry based integrated science and language program. Its objective is to develop English proficiency in Spanish dominant students in grades 1-5. Project Co-Arts is a national study of community arts educational centers in economically disadvantaged communities. Its objective has been the discovery of a model of and authentic methods for assessing educational effectiveness.

Project Co-Arts has helped PRISM researchers and teachers embrace and adapt for their own needs Co-Arts' emerging methods of assessment and documentation. With PRISM's focus on science and Co-Arts' concentration on the arts, the two projects may seem unlikely collaborators. Nonetheless, they have been successfully linked because of their shared perspectives on two concepts: 1) process based education and assessment and 2) the methodology of "portraiture" to develop an authentic interpretive description of programs. The result of the collaboration is a unique approach to evaluation of educational effectiveness for Project PRISM and a refinement in the portraiture methodology for Project Co-Arts.

We begin by presenting the PRISM program, then describing Project Co-Arts and its development of the methodology of portraiture, and the relevant elements of the Co-Arts Assessment Plan that were adapted by PRISM researchers. We then discuss PRISM's particular uses of the Co-Arts methodological structures, and conclude with our respective reflections on our shared efforts.

The PRISM Program

Project PRISM (Process in Science Methods) is an elementary bilingual science project of The NETWORK, Inc. in Andover, Massachusetts. Funded in part by the U.S. Department of Education's Office of Bilingual Education and Minority Language Affairs (OBEMLA) Special Populations program. While PRISM has been particularly interested in bilingual gifted and talented students, it does not employ a "pull out" approach: it serves all students in participating classrooms.

Project PRISM, now finishing its third and final year, grew out of a recent worldwide movement in second language acquisition to integrate the teaching of language with the teaching of content. The project involves the collaborative efforts of both the bilingual and ESL classroom teachers as well as the mainstream classroom and science teachers. However, unlike typical content-based ESL programs, the language of instruction is not limited to English.

Children in bilingual and ESL programs typically are transitioned out of those programs after three years, despite research (Collier 1989) that says academic language development takes up to seven years. Once out of supportive classrooms, children whose first language is not English often perform below their own and others' expectations in mainstream classes. PRISM attempts to have mainstream classroom teachers as well as bilingual and ESL teachers attend to the language development needs of their linguistically different students as they teach science.

In addition, many of these same children abandon demanding science courses when they reach secondary school because of the slow pace at which their academic language develops and because of limited exposure to authentic scientific methods and processes. These children have been underserved in science classes; they need on-going language development in a mainstream science classroom and in many instances they have abandoned any aspirations to pursue science in the upper grades or in future careers.

PRISM tests the belief that language acquisition both native and English is enhanced for elementary school children when language is acquired in content area learning, specifically hands-on, inquiry/discovery science. With enhanced language acquisition comes fluency in academic content subjects and a likelihood to pursue advanced content course work and potentially move into the courses they will find in the future.

The Bridgeport and New Haven Connecticut public schools worked with researchers from The NETWORK, Inc., PRISM's sponsoring agency, who provided training and technical assistance in bilingual education with these same districts from 1985-1991. PRISM researchers work with four schools, two in New Haven and two in Bridgeport, all with more

than 50% linguistic minority children. The research team for PRISM is a coalition of experienced educators including Migdalia Romero and Carmen Mercado, consultants, Rick Basom, evaluator, Wendy Dameshek, staff associate, and project director, Jon Kaiser. Each devotes part time to the project, in addition to their other pursuits in teaching and research.

PRISM embraces a constructivist approach emphasizing inquiry and discovery for learning science and an integrated language and content approach for the acquisition of English. Thus children learn scientific processes, methods, and procedures, and use science materials while developing their use of English. In some of the PRISM classrooms, there is selective use of the primary language. However, the goal of the project is to acquire English, while at the same time making progress in the acquisition of scientific knowledge.

PRISM's orientation toward constructivism and some of The NETWORK's previous experience in bilingual education are also rooted in whole language methodology. In addition, the National Center for Improving Science Education, a major division of The NETWORK Inc., developed models and recommendations for K-12 science education on which PRISM is based.

Some of the similarities and theoretical ties to past projects and to constructivist thinking are reflected in the PRISM schools. Central to the beliefs of whole language pedagogy is the construction of meaning by the learner from the text, from their own schema, from their discourse with others, and from the revision of their initial hypothesis. This pattern is paralleled in the Goodman's psycholinguistic circle -- PREDICT - CONFIRM - REVISE -- a recursive process found in reading theory that is also at the heart of the scientific method.

Just as the construction of meaning is at the heart of a whole language pedagogy, the scientific method is at the heart of an inquiry/discovery approach. The scientific method starts with generating the hypothesis, moves to testing the hypothesis, continues with stating the results, and completes the cycle by revising the hypothesis. If the hypothesis is incongruent with the results, the cycle is repeated.

Underlying PRISM's constructivist pedagogy is the belief that teachers and learners pose problems (Duckworth 1987) that have relevance to their work. In the PRISM schema, students are encouraged to ask questions that help them clarify their perceptions of what they are seeing, hearing, doing and understanding. PRISM shares Vygotsky's belief (1962) that language is thought and thought is language. Thus scientific thinking and language development are symbiotic. Learners resolve or make sense of their cognitive conflicts through concrete experience, collaborative discourse and reflection.

PRISM classroom activities are adapted to reflect students' suppositions and world views. What students know and can do are at the center of our inquiry. We also posit that deeper understanding less "material" makes for more meaningful learning than covering many activities superficially. The following principles underscore the project's efforts to document

effective practice and show gains made by both teachers and students:

- Science is a rich content area -- rich with materials, phenomena, and processes -- that offer many opportunities for observation, thought, and reflection from which both spoken and written language is produced.

- Language is acquired more easily when it is part of meaningfully constructed contexts and opportunities that substantially involve the frameworks and schemata of the actual learners.

- Children exiting from transitional bilingual education programs often find the switch to a content area emphasis in the mainstream classrooms difficult.

- Change is a process not an event, thereby requiring collaboration, teamwork, and long term commitment necessary in the complex settings of human organizations, such as schools.

Project Co-Arts and the Development of Portraiture as a Group Process

Funded by the Nathan Cummings, Geraldine R. Dodge, and Ford Foundations, Project Co-Arts set out to study educational effectiveness in community art centers around the country and to document the effectiveness of five veteran centers that were representative of the field. In exploring methods of documentation, they chose the methodology of portraiture as it had been developed by Professor Sara Lawrence Lightfoot in her book, *The Good High School*. Portraiture is a process of interpretive description which pushes the boundaries of ethnographic case study into the realm of aesthetic narrative. With this methodology, the researcher does more than render an account of a given educational scenario -- the researcher includes aesthetic aspects of literary narrative like colors, sights, sounds, and dialogue.

Structuring the resonant stories that define an educational experience into a cohesive and balanced whole, researchers implementing portraiture seek to hold a glass to the experience they are observing. If they are constructing an authentic portrait, their subjects will be able to look into that glass and say, "Yes, that is us." The portrait may be very different if the subjects had created it themselves. Self-portraits often reveal a different understanding of a subject than others would have known. Nonetheless, in successful portraits, subjects will be able to affirm the likeness and even perhaps see aspects of themselves they take for granted or had not noticed. Such an aesthetic process seemed especially apt for accounts of arts education negotiated by professional artist educators as it is in the community arts centers which Co-Arts studied.

Portraiture was marked in *The Good High School* by the hand of one artist, one researcher braving new terrain: Lawrence Lightfoot. Project Co-Arts had half a dozen researchers eager to extend the limits of this new terrain. In developing portraiture into a methodology that

could be implemented as a group process, Co-Arts researchers worked for two years to develop a structure that retained the central elements of Lawrence Lightfoot's process while accommodating the hands of several artist/researchers and the constraints of the model of educational effectiveness that had been developed. These central elements of portraiture and the constraints of the Co-Arts model were the guiding lights of PRISM's implementation of these methods.

Central Elements of Portraiture

Four central elements were identified as key to the implementation of portraiture: **voice, context, emergent themes, and the notion of an aesthetic whole.**

Voice is most readily understood as the preoccupation/s of the researcher. Voice is the lens applied to the educational experience which co-constructs (intermingled with constituents' own voices) the representations included in the portrait and shapes (as a result of active dialectic with constituents and data) the aesthetic whole.

Education does not happen in a vacuum. Portraits contextualize their subjects. Whether through careful description of the surrounding community or the atmosphere in the school house, portrait writers **contextualize** their subjects and place them vividly against the backdrop of space and time within which the educational experience is occurring. Co-Arts researchers called this part of their portraits, the "outside in" that took their readers from the broadest ecology to the central aspects of their portrait subjects.

Emergent themes are marked by repeated refrains and recurring consonances (and off-set by dissonant threads) within the fabric of the educational experiences. Themes emerge from all aspects of the data and serve to authentically structure the portrait of the particular educational experience. What matters to constituents? What stories resonate throughout the data?

The notion of **the portrait as an aesthetic whole** undergirds the methodology. Like artists, portrait writers are balancing the elements of voice and context and emergent themes and structuring them into a finished piece that will be spare enough to be accessible and rich enough to be true. Balancing the many parts into a cohesive whole is at the core of the aesthetic process of portraiture.

Constraints of the Co-Arts Model

After three years of close study of exemplary community art centers around the country, Project Co-Arts devised a process-based model for educational effectiveness. Departing from the static view of educational effectiveness as the realization of prioritized goals, Co-Arts researchers embraced a view of educational effectiveness as a process that happens over time and is marked by a variety of symptoms. In this process-based model, goals, practices and outcomes may change over time, but in educationally effective settings, they are monitored by

careful reflection.

The Wheel. As a model for this view of effectiveness, Co-Arts developed a wheel (see figure 1). The wheel is divided into the four dimensions across which educational effectiveness was seen to occur in the setting which Co-Arts studied: 1) Teaching and Learning (pedagogical structure); 2) Journey (history and future vision); 3) Community (community served); and 4) Administration (organizational structure). The process of effectiveness was marked by a balance over time of the generative tensions indicated in the model: acceptance and expectation; tradition and innovation; seamlessness and individuation; and flexibility and integrity. Generative tensions mark the dynamic interplay among goals, practice, and outcomes within and across the four dimensions that are keyed to each dimension but are related to all four.

A full explanation of the Co-Arts model can be found (along with Project Co-Arts' portraits) in the two volume final report which is available from Harvard's Project Zero: *Safe Havens: Portraits of Educational Effectiveness in Community Art Centers that Focus on Education* and *The Co-Arts Assessment Handbook*. The dimensions and tensions that Co-Arts developed and implemented in their portraits served as a useful structure in PRISM's implementation study.

In the first Co-Arts/PRISM working session, PRISM researchers brainstormed about program goals, practices, and outcomes. Looking within and across these goals, practices, and outcomes (just as Co-Arts had done with the community art centers), over a few sessions, PRISM researchers were able to determine four salient program dimensions: *Inquiry, Interaction, Reflection, and Transformation* (see figure 2). These are the dimensions across which effectiveness could be realized in terms of the program's overall objectives for and practices regarding both students and teachers in the PRISM program. In the last working session, PRISM researchers identified the generative tensions that emerged from each of these dimensions.

In the dimension of *Inquiry*, which is at the heart of PRISM's constructivist model, the PRISM student is balancing the tensions of what is known (knowledge that is already at hand as a foundation) and what is unknown (knowledge that is needed or desired). In the dimension of *Reflection*, the student is balancing the tensions between action (what is actually done and observed) and thought (analysis of that observation - what will/should happen next). In terms of *Interaction* between students and/or students and teacher, there is a balance between self (as an interactor) and other (as an interactor). And finally, in the dimension of *Transformation* from teacher to learner or passive to active learner, there is a negotiation between gain (all the advantages that change will afford) and loss (the loss of the security of familiar roles).

These dimensions will become clearer with further description of the PRISM program. For now, however, it is important to note that for PRISM, as it had been for Co-Arts, an underlying structure for educational effectiveness was discovered. These structures were the result of close study and/or intimate knowledge of their respective educational scenarios. In

structuring portraits, this structure framed for each group of researchers what can be identified as a "group voice." Above and beyond the differing voices of individual researchers who have very different experiences from one another, this shared vision of educational effectiveness served to structure the researchers' portraits. In the portraits of Project Co-Arts, the dimensions were considered within emergent themes. In the portraits of Project PRISM, portraits were actually organized around the dimensions themselves. In each portrait, researchers framed a section on Inquiry, one on Reflection, and so forth. The elements of group voice in both cases served to structure the aesthetic whole.

The Processfolio. The Co-Arts Plan for Assessment features two components: 1) the Assessment wheel which is described above and 2) the organizational processfolio. Centers that are implementing the Co-Arts Plan are staging what are called assessment forums, meetings with constituents from around the center, to consider educational effectiveness as it is represented in the wheel. They are also compiling center-wide "organizational processfolios" or ways of collecting evidence. Rather than serving as a collection of *best works*, processsfolios contain examples of developing work over time.

Based on Harvard Project Zero's student processfolios which document a student's *footprints of learning* over time, the Co-Arts' organizational processfolio is designed to document educational effectiveness on a broader scale: that of the community art center, classroom, or school, or in PRISM's case, the program or innovation. In a community art center, an organizational processfolio might contain selected examples of student work, letters from parents or instructor journal entries. PRISM researchers and teachers compiled program wide processfolios for organizing their data for further analysis. Envisioning the processfolio as a file with internal sections, they had a section for each of their four dimensions. When they encountered rich examples of students' communicating with one another in a PRISM site, those data went into the processfolio's *Interaction* section. Rich examples of teacher reflection went into the Reflection section, and so forth. This process continued throughout a period of compilation, providing the raw material for analysis and the writing of their portraits.

PRISM's Need for Assessment and its Discovery of Portraiture, the Co-Arts Way

According to OBEMLA guidelines, every Title VII project has the built-in requirement of showing gains in the acquisition of English for their students. PRISM is no exception. However, PRISM had more of a story to tell than simply that students were able to speak and write better. Furthermore, it was other aspects of the project than improvement in English that were important to convey to others that moved the project to consider portraiture to document effectiveness. In the section that follows, PRISM researchers and participants describe their need to use portraiture as an assessment tool. It is marked by a change to the "we" pronoun to convey the personal nature portraiture had for PRISM's researchers.

The constructivist paradigm guiding our work required us to measure how well those implementing PRISM had moved away from a knowledge transmission model of teaching to a more facilitative one. We believe that constructivism is a theory about knowledge and learning, NOT about teaching. Knowledge is constantly evolving, generated by discovery and inquiry. It is developmental, socially and culturally bound and thus is subjective. It emanates from the learner not from the teacher or some objective "body of knowledge" that in our wisdom as educators we have deemed appropriate for all children to know.

We needed to document the different teaching-learning contexts in which the project was operating. These ranged from bilingual pairing models where one teacher does all the instruction in Spanish and one does all the English instruction to a monolingual English class that was self-contained and received children from the bilingual program. Between these two ends of the continuum were a variety of settings, including a self-contained bilingual class with a full time paraprofessional; a collaborative model where a bilingual and mainstream teacher team up for PRISM activities; and a bilingual teacher who, although part of a pairing model, did not implement the project with her pair, but did so by herself.

Since we believed the rich diversity of our settings contributed so much to the actual effectiveness of PRISM, we knew that our evaluation goals needed to go well beyond the Title VII requirements. Furthermore, we were attempting to break set with traditional Title VII evaluation and craft a final report that left a legacy that teachers could read, understand and replicate.

Fortunately, we had a senior researcher at The NETWORK, Michael Huberman, whose work in the blending of quantitative and qualitative methods (Miles & Huberman 1994) made him a vital resource in our initial inquiry. He has a joint appointment at The NETWORK, Inc. and at the Harvard Graduate School of Education. Through his work at HGSE, he recommended that we contact a colleague of Sara Lawrence Lightfoot at HGSE.

The first encounter between two PRISM researchers and Lawrence Lightfoot's colleague, Jessica Davis, became the first entry in a researcher's processfolio for *Interaction*:

> *So off into the early morning fall light we (the PRISM evaluator and Project Director) trekked into Cambridge to hear the tale of portraiture. Thinking this would be a meeting of perhaps an hour's duration, we parked at a two hour meter opposite Longfellow Hall, site of Co-Arts' offices. When we emerged over three hours later, we had our first success indicator of this new relationship, a $10 parking ticket. It was obviously telling us that this incipient relationship was for real.*

PRISM's Reasons for Choosing Portraiture as its Documentation Process

While traditional case study methods could have been used to document variations in the implementation of PRISM and the shift teachers were being asked to make to a constructivist pedagogy, portraits offered us an option that had a greater sense of voice of the researchers and more options for authentic stories of the teachers and their students. Portraits are more representative of the real voices of all those who define the practice than the case study. They have the potential to communicate the message of the classroom clearly and in the authentic language of teachers. They are readable, understandable and above all strive to capture the essence of the educational experience without the obfuscating language of formal cross-site analysis designs. They do, however, enable the research team to make comparisons across sites along the project dimensions. As indicated in a earlier section of this paper, all of our portraits are written along the four PRISM design dimensions: inquiry; interaction; reflection and transformation and reach for a closer approximation of the way teachers really talk and tell their stories.

Moreover, portraits do not require a sequential process of data collection and subsequent analysis. Portraits allow the researchers to do their own analysis as they move along, more like an independent ethnographer. Although the PRISM research team met on a regular basis to collaborate on a multiplicity of shared issues and perspectives ranging from logistical questions such as numbers of visits to pedagogical questions such as definition of PRISM key components, there was at the same time a large degree of freedom for them to set visitation schedules independently, to structure time with teachers and students to be mutually beneficial and to set their own agendas within the agreed upon parameters of the team's modus operandi. We did not structure observation or interview protocols for researchers to follow and only informally coded tapes to meet our need to describe the four project dimensions. We had freedom to pursue events, conversations, operations, verbal exchanges as they fit into a holistic picture. They could have been one of a kind, idiosyncratic; but each researcher had the freedom to explore, to follow hunches, and to do so knowing that their teammates were doing the same and would fundamentally support their efforts.

Portraiture's Suitability for PRISM Data

PRISM has produced some very different kinds of data including writing samples, oral language samples, attitude surveys (teachers), pre-post paragraphs from students on their perceptions of what scientists do, classroom observations, student journals, teacher journals, school science fairs, events, and field trips. Although it would have been possible to analyze all our different data sets independently, that approach would have produced a disparate set of analyses based on school and classroom implementation variations as well as data collection limitations.

Because PRISM is not a research project per se, we were looking for a methodology that would allow us to communicate the effectiveness of the project in a way that teachers would be

able to understand - not "evaluationese." We needed a way to connect all of the parts of the project so a complete picture of how the project worked in classrooms was out front supported by details we had collected but not as isolated data sets. To achieve the integrated whole, our portrait dimensions served as the cohesive framework a framework that we would not have had without using the methodology of portraiture. We needed to show the liveliness of the project in classrooms; the paradigm shift in teachers; the language development in students; the collaboration between PRISM researchers and teachers; the evolutionary nature of the project as it was implemented in a variety of settings.

Because we know bilingual educators are always interested in the linguistic dimensions of a project, we decided right away to include language samples in the portraits. Written and oral pieces have been included in each portrait. Analysis, however, has been done using a non-traditional design instead of language production criteria such as syntax, sentence formation and length, word analysis, or cohesive markers, to name a few. No comparison was made with students outside PRISM and we were not constrained by data collection timelines. Attending to our dimensions, portraiture gave us the freedom to collect whatever we could, and to organize and analyze it using the four dimensions. Thus we have, in part, applied the four dimensions of PRISM that we have used in our portraits as standards to which written and oral samples are judged. For example, we have analyzed student language samples from three points in time during the last year of the project. Some samples were collected from the first two years of the project, but nothing close to the depth and breadth that was achieved when we began our portraits in year three.

The process of determining the four dimensions helped the research team to gain some measure of consistency with regard to the key indicators of success in the PRISM program. Not only did we gain some consistency across portraits, but the process also helped researchers clarify for themselves and each other what indicators would show development and growth. We went through three different iterations of indicators for each dimension. Those working sessions with all researchers "butting" heads were the most productive days we would spend together owing in large part to the facilitation skill of our portraiture mentor, Jessica Davis. But the real feature of portraits is not that they create opportunities for the development of consensual frameworks, but that they engage an inclusive methodology using real descriptive language which allows for individuality in researchers' voices. To use a political metaphor, it is our version of "the big tent".

History of the Collaboration between PRISM and Co-Arts

Once it became apparent at our first meeting together that portraiture was the research methodology of choice, Jessica Davis, Co-Arts' project director and Jon Kaiser, her counterpart at PRISM, outlined a timetable and a series of "events" to move the collaboration forward. Five events were designed to help us through our journey. We started in July of 1993 with a day long retreat to first identify the dimensions of PRISM as they pertained to our version of the Co-Arts wheel. This was followed by three working sessions where indicators

of the dimensions were clarified by the research team and the portrait classroom teachers who were the third and most important piece of our collaboration. The three clarifying meetings where capped by a presentation at MABE (Massachusetts Association for Bilingual Education). The fifth session, in May of 1994, was a Writers' Workshop for the research team, each of whom had written an "outside in" introduction to their portraits. With the assistance of veteran Co-Arts portrait writer, Natania Remba, Jessica led a peer review of the "outside ins." Also at that session, we completed a full outline of the final product which combines the portraits themselves with all the contextual information about their formation and about the project.

Jessica's role in the collaboration was critical to its success. After each of the planned "events" she sent a written summary to Jon; they shared perceptions of team status; she then made modifications to her summary and notes which Jon circulated to the team. These summaries (see attached samples) became working documents for the researcher and after each "clarifying" meeting where indicators were being shared and collected, the summaries were essential in our pursuit of a shared vision and some consistency in researcher perceptions about their respective portraits. Finally, Jessica agreed to read each portrait and provide individual assistance to the authors.

PRISM Teachers' Role in Implementation: Assessment as Intervention

In addition to working closely with Project Co-Arts, PRISM researchers also collaborated with portrait teachers in constructing the PRISM portraits. PRISM teachers played an integral role in developing the dimensions that were central to the assessment framework. Toward that end, portrait teachers participated in periodic meetings with PRISM researchers to discuss the dimensions from their own perspective, and to formalize criteria for the analysis of students' written and oral samples. PRISM researchers sought input from the teachers to build consensus as a team about how to describe perceived impact and improvement of language proficiency as a result of Project PRISM. The documentation of the implementation of Project PRISM also became a responsibility shared by the portrait teachers and the PRISM researchers. Portrait teachers played an instrumental role in collecting data for the portraits from their own classrooms by sharing their observations of their students during science investigations and by keeping journals of their observations about their students.

As a result of the teachers' participation and involvement in shaping the overall framework for assessment and collecting useful data from their classrooms, most portrait teachers simultaneously began to refine their own approach to teaching/doing science. Two portrait teachers who worked as a pair for science, viewed the dimensions as "requirements" for their science investigations. These two teachers carefully planned their science investigations so that evidence for all four of the dimensions (inquiry, reflection, interaction, and transformation) was apparent. Similarly, at one of the collaboration meetings between PRISM researchers and portrait classroom teachers, one PRISM researcher mentioned that during a discussion with

two other portrait teachers, he noted that he had not heard any mention of one particular dimension during a previous science investigation. The teachers carefully took note. It was evident during the next science investigation, that the teachers had planned the investigation around this one particular dimension. It seems fair to suggest that because portrait teachers were involved with the documentation process, they became more aware of the "expectations" and "ideals" for Project PRISM in their classrooms and made adjustments in their practice.

Through the ongoing and evolving process of assessment, teachers were able to reflect about the pedagogical shift within their own classrooms. Through their documentation efforts, most of the portrait teachers recognized the change from the role of the "teacher" to the role of the "facilitator" (asking questions and allowing their students to freely communicate and interact with their peers, teachers, and materials). One portrait teacher stated at the end of the final year,

> *I think [PRISM] has had an impact on both me and my students...it has had an impact on myself and parts of my teaching and then it has impacted my students through the way I teach...science has taught me more about cooperation, letting the kids work together, and letting the kids do more of the figuring out part.*

One of the most unique aspects of the PRISM portraiture process, was that it was not conducted by an external evaluator or researcher, or by an outsider. Evaluation of Project PRISM was completed by PRISM researchers and portrait teachers, most of whom had already been involved with the project for two years. The process of developing an assessment framework for Project PRISM and the process of documentation enabled portrait teachers and PRISM researchers to take a step back and look at the whole classroom (including the students and the teacher) from the "outside" and it provided teachers the opportunity to reflect on their own practices.

Relationship Between the Teacher and the PRISM Researchers

PRISM researchers had a dual role in their portrait classrooms: researcher on the one hand and facilitator, mentor, and coach for their teachers on the other. The relationships between PRISM researchers and portrait teachers that had already been established were significant elements in the portraiture process. The fact that portrait teachers and PRISM researchers were comfortable with each other and were already familiar with each other's styles and personalities contributed to the authenticity of the assessment of the project. Portrait teachers and PRISM researchers met periodically on an informal basis to share journals and field notes and to discuss observations and portrait teachers frequently asked PRISM researchers for feedback. The process through which portrait teachers integrated the feedback and suggestions, became evidence of work in progress. For example, one portrait teacher who had generally been a more "traditional" teacher, openly stated to a PRISM researcher during a science investigation, *"We're not using any worksheets today...students will have to think for themselves -- we're improving."*

The relationship between a PRISM researcher and a whole classroom [students and teacher(s)] was another key element leading to the success of portraiture. The PRISM researcher responsible for a particular portrait over time became familiar with the teacher(s) and the students. Because the assessment and documentation process for PRISM was ongoing, and took place over the course of seven months, PRISM researchers were not seen as outsiders to the classroom. However, even though PRISM researchers visited a particular classroom extensively, in many cases, three of them were outsiders to the teacher(s) and students in terms of language and cultural differences. It may have been the case that portraits varied due to language and cultural differences between the researcher and the teacher and students. This may also be true among the five PRISM researchers who vary in language, culture and research paradigms and training. For this reason, each PRISM researcher wrote an introduction for his or her portrait, which included that researcher's personal background, professional background, length of relationship with the teacher, and length of relationship with the program. Portraiture represented a common approach that all parties could comfortably share.

Particulars of the PRISM Portrait Writing Process

PRISM portrait sites were carefully selected across several key variables to demonstrate how the project was implemented in five very different classrooms. In addition, differences among researcher/facilitator perspectives would affect each portrait as well. PRISM researchers adapted Project Co-Arts' "generic" outline for structuring the portraits as a whole. They initially organized their own data differently, some using the four project dimensions and others identifying emergent themes within the classroom. Ultimately they agreed that the data would be reported in each portrait using the four dimensions. Although using the identified PRISM dimensions provided group voice, the individual researcher's different voices resounded through their portraits as well. Identifying generative tensions across all five classrooms occurred after a full outline was developed, site visits had been largely completed, and most of the data had been collected. While identifying commonalties was a group process negotiated by PRISM researchers with Co-Arts support, writing the portraits remained an individual task for each PRISM researcher.

Recap and Reflection from our Respective Positions

From the Co-Arts perspective, the collaborative work with PRISM researchers was rewarding on a number of levels. It was very exciting to see a structure which had been developed in one setting (community art centers) applied to another. The fact that the Co-Arts Plan and the methodology of portraiture have so many aspects of an artist's tool box for assessment and documentation made its application by science/language educators especially intriguing. Artists offer expert models of process implementation and assessment. It is one thing to see that expertise applied to settings for arts learning; but quite another to see that expertise be of equal use in non-arts educational settings.

Co-Arts researchers were, for the most part, fledgling researchers braving new territory with naive courage. PRISM researchers were primarily experienced researchers. But their spirit of adventure and courage to explore was equally keen. It may, however, have been more of a challenge for veteran researchers to readjust their established preferences of data collection, analysis and reporting to the less familiar framework of portraiture. Nonetheless, they did so with diligence and brought their experience and insight to this developing process.

From the PRISM perspective, three important goals were achieved: first, evaluation and documentation of the program became a group effort, shared with the portrait teachers, and an enriching and formative experience for all; second, the methodology of portraiture enabled the PRISM researchers to reach consensus on essential project characteristics that were essential in the implementation; and third, descriptions of five very different classrooms documented by five very different researchers have been synthesized into one document that richly describes the diversity and authenticity of the practice. The resulting product is readable and comprehensible by teachers everywhere. Teachers are the audience who in the future will most likely use this work for their own implementation of an integrated language and content program.

Throughout this collaboration, when PRISM researchers would look for answers to what to and not to do, they were constantly reminded that they were only the second phase in the adaptation of portraiture into a group process. Just as individual artists have their individual styles that are indelibly imprinted on their works of art, so do individual portraiture researchers redefine the methodology and imprint themselves on their final portraits. Using portraiture as a group process, the imprint is a co-construction negotiated by a program or a project or whatever comes next? We hope that others who learn of this developing work will brave the new frontier and take portraiture a step further, holding to the underpinnings from which it derives its rigor and reaching for the individual definition from which it produces its authenticity.

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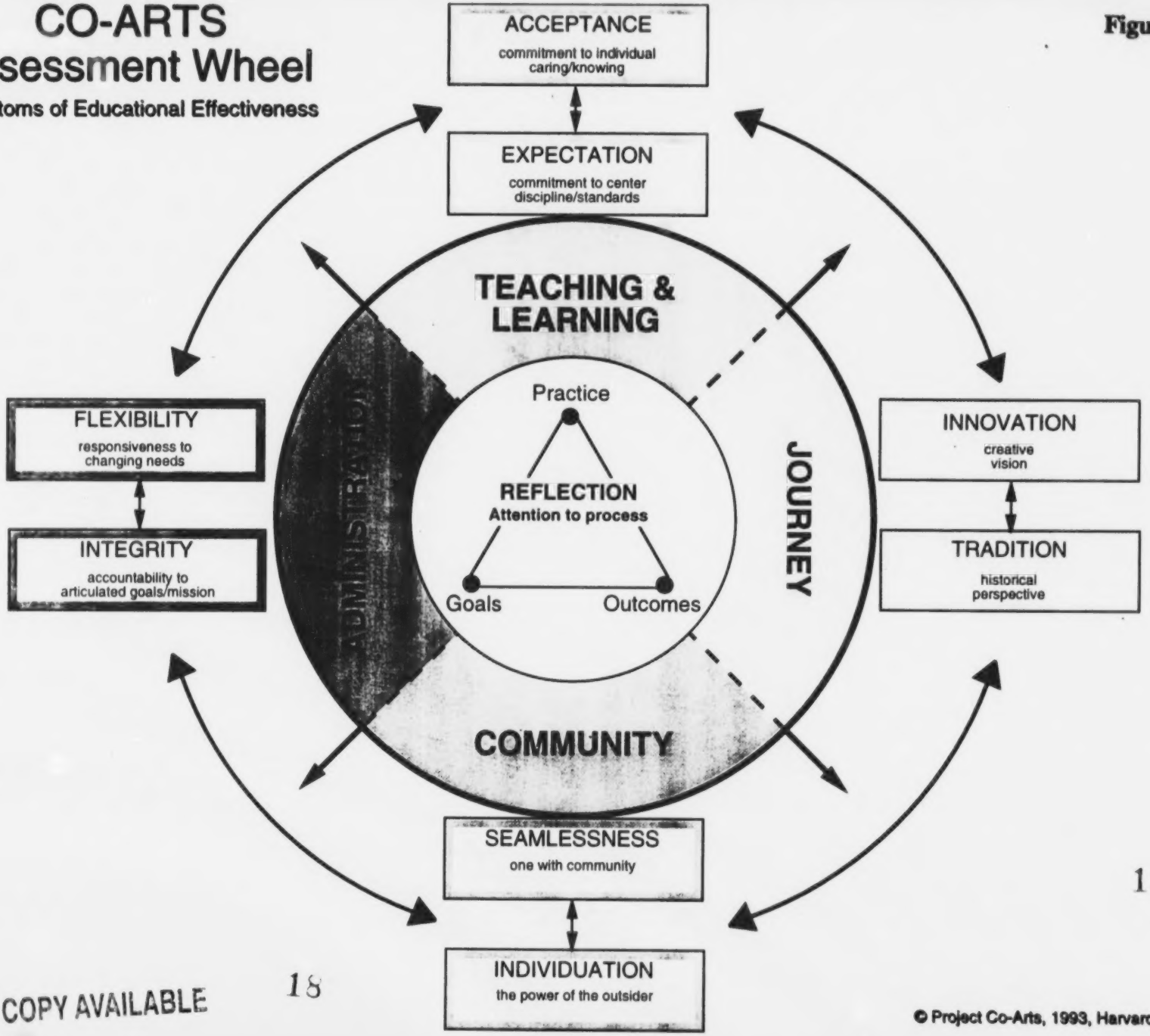
CO-ARTS Assessment Wheel

Symptoms of Educational Effectiveness

Figure 1



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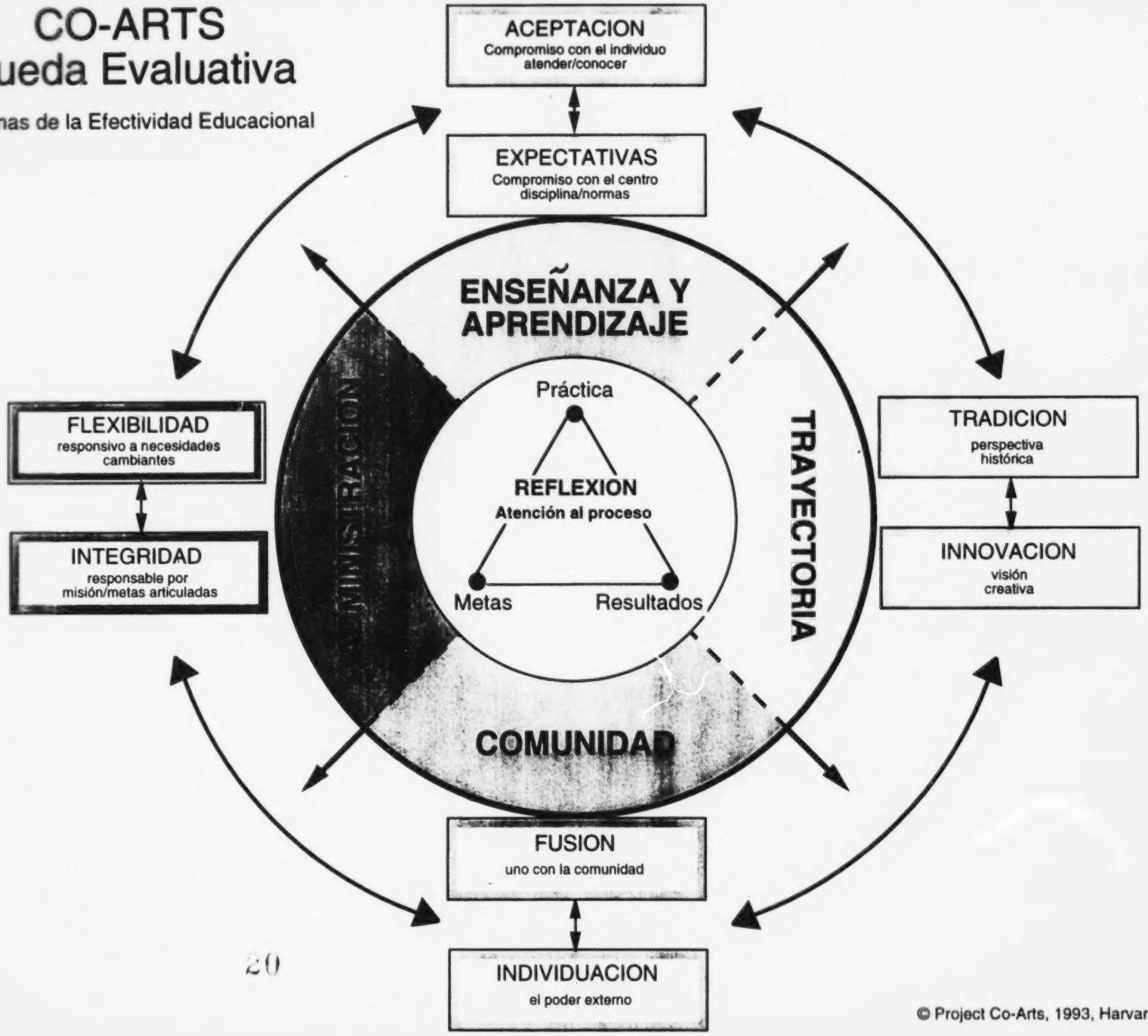
CO-ARTS
Rueda Evaluativa

Síntomas de la Efectividad Educacional

Figure 1



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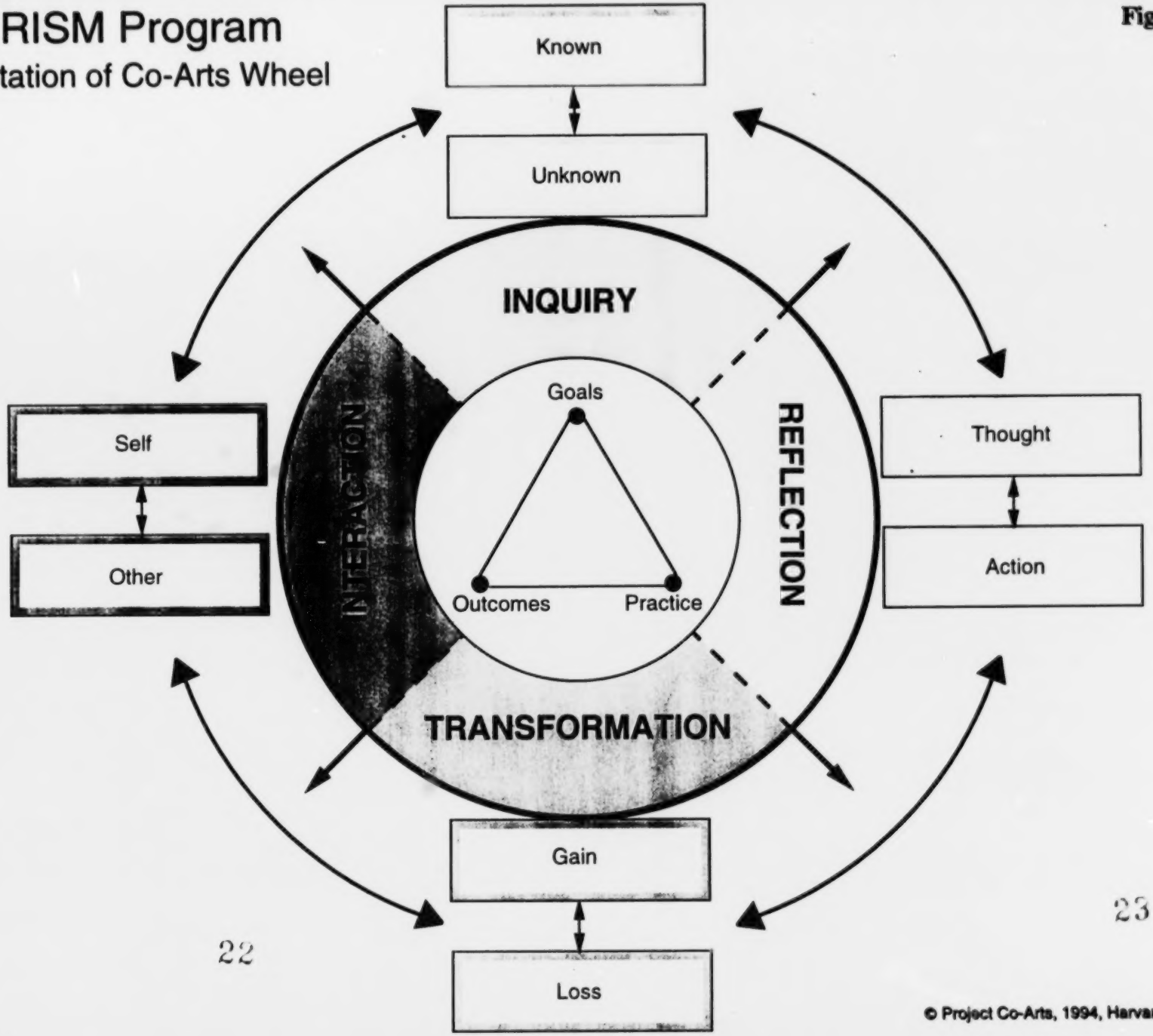
PRISM Program

Adaptation of Co-Arts Wheel

Figure 2



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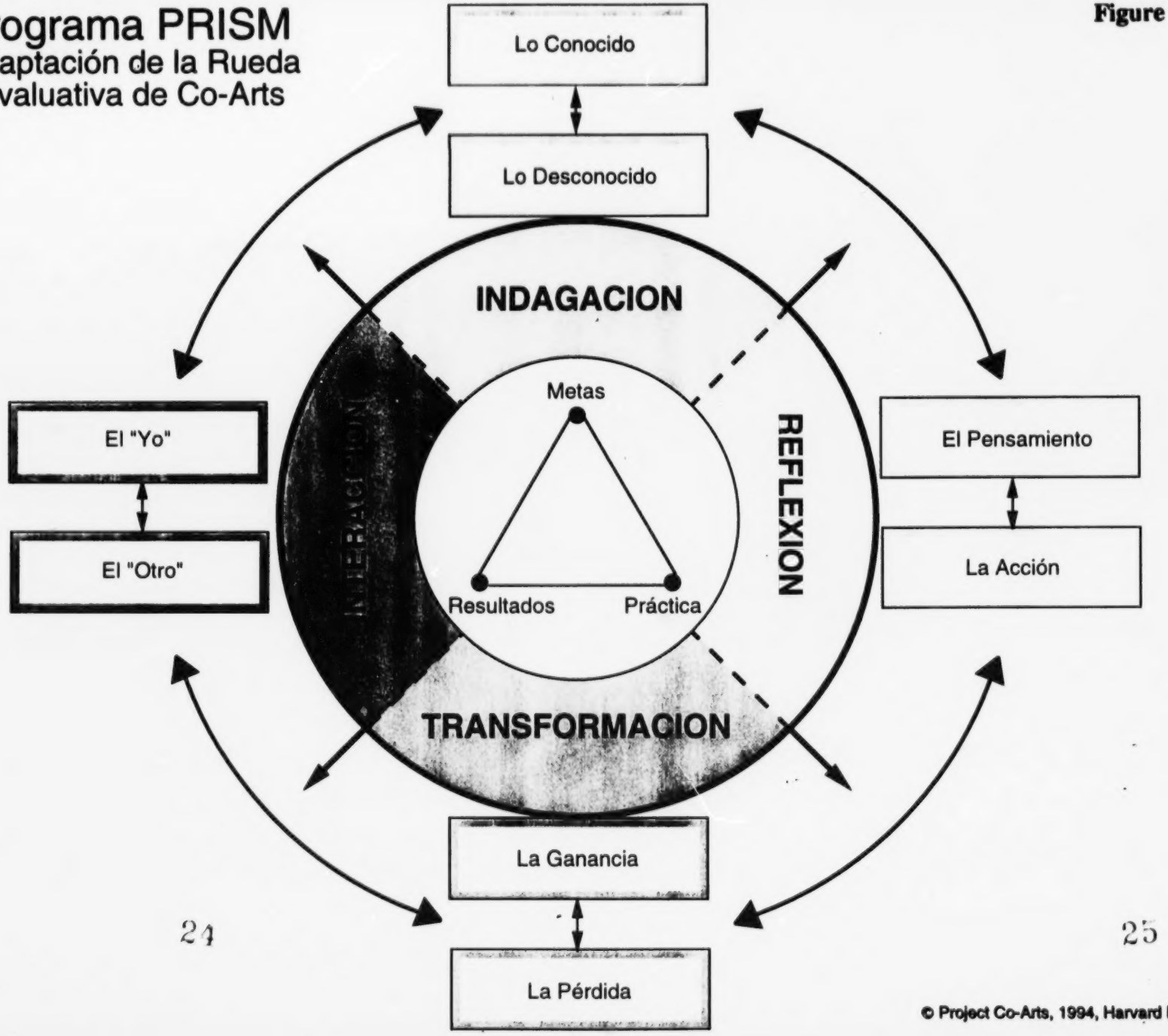
Programa PRISM
Adaptación de la Rueda Evaluativa de Co-Arts

Figure 2



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To: Prism Team
From: Jessica Davis
Re: Our last session
Date: 6 October 1993
Revised Nov. 1

Thanks for a very stimulating and I think most productive session. I am reaching for some bottom line summaries that hopefully are of use to you in the next step of this process. Everything herein is informed by 1) the collection of portraiture memos you have in hand; and 2) The Introduction to Co-Arts II.

I. Some working definitions which we discussed:

1. Vis-a-vis the Co-Arts Wheel:

Dimensions: the relevant areas (as determined by reviewing the broad landscape of goals, practices, and outcomes and reaching for categories) across which relative educational effectiveness is imprinted. The dimensions overlap and are mutually informative.

Symptoms of educational effectiveness: Process markers that may indicate the extent to which things are "going well." Sets of balances (or balanced generative tensions) that emerge from in-depth study of effective educational process within and across the relevant dimensions. These symptoms emerge from the separate dimensions but may mark effective practice in any or all of the dimensions (hence the turns of the wheel).

2. Vis-a-vis Portraiture

Portraiture: Interpretive description. An aesthetic process through which educational experience is documented pushing the boundaries of ethnographic case study into the realm of aesthetic narrative.

Voice: The preoccupation/s of the researcher. The lens applied to the educational experience which co-constructs (intermingled with constituents voices) the representations included in the portrait and shapes (as a result of active dialectic with constituents and data) the aesthetic whole.

Emergent Themes: Marked by repeated refrains and recurring consonances (and off-set by dissonant threads) within the fabric of the educational experience. Themes emerge from all aspects of the data and serve to authentically structure

the portrayal of the particular educational experience from inside out. What matters to constituents. Identified through data gathering marked by listening for rather than listening to stories and ongoing dialectic with data.....

Context: The broadest ecology: the backdrop of space and time within which the educational experience is occurring. The Outside In: as from city to neighborhood to classroom to teacher/student exchange.

Aesthetic Whole: The end in view; the unified piece replete with visual image and pace and context, structured around emergent themes derived from repetitive consonances as well as dissonant threads and importantly shaped by hard decisions of omission as surely as careful decisions of inclusion.

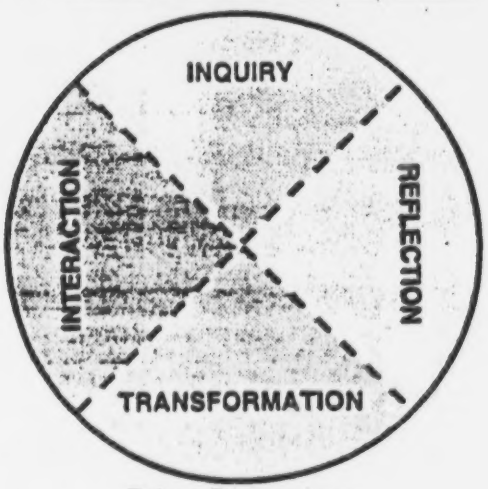
II. Prism differences in Process of Portraiture (from Co-Arts)

1. Teachers as collaborators in data gathering.
2. Documenters as connoisseurs; not there as researchers
3. Teachers as collaborators in portrait constructions
4. Documenters as program facilitators/ in and out of portrait; not flies on the wall...makes portrait somewhat of a self-portrait.

III. Prism differences in Relevant Dimensions (from Co-Arts)

1. Educational Effectiveness on Program vs. Organizational level
2. Dimensions on level of teacher/student learning
3. Wheel of Prism Dimensions motored by overall goal of language acquisition accessed through science learning.
4. Expertise of Prism staff allows them to provide schema of dimensions through which to organize data collecting for portraits: listening for story within and around these dimensions.....

IV. Discussion of Prism Dimensions



Prism Dimensions:

It was suggested that each of these dimensions exists on a student and on a teacher level.....

1. **REFLECTION**

   a) **Definition**: Student/teacher "messes around" with observations; generates new hypotheses. Not jumping to conclusions; not accepting quick answers. Returning to an experience with new questions. Entertaining alternative explanations. The reconstruction of the experience in other settings.

   For teacher: reflection may be on one's own growth; or one's own pedagogy, or on scientific questions/problems.

   For student: reflection may be on science problems encountered in class and reconstructed in recollection.

   b) **Dimension goals**: Re-play or re-construction and Re-interpretation: That students "play back" learning scenario at home or in different settings at different times and return to the experience with new questions (re-connecting) and/or entertaining different explanations or solutions. The sharing of surprise outcomes.

   That teachers make connections with other disciplines across the curriculum; make time for alternative experiences for students to which they can bring in-class experiences and reflect upon them in new context.

Teacher devotes time to reflection; it is "mindful, deliberate, planned and conscious." Teachers reveal their own process of reflection to students and model reflection for them.

c) **Possible sources of relevant evidence:** Records of lunch talk; reports from home; projects done at home. Class talk; in class dialogue between student and teacher or student and student or as recorded in student writing; responses to interview questions. Recorded dialogue in class and beyond class. Reportage as documentation of alternative experiences. Teacher logs or journals.

d) **Classroom teachers' responses to dimensions:**

- internal thinking (teacher or students)
- teacher promotes reflection by modeling, setting up materials/centers
- encourage kids to compare discrepant events with teacher guidance
- linked to inquiry
- internal inquiry -- "What you see vs. what you expected."
- self-assessment

2. INQUIRY

a) **Definition:** Is of the moment; the asking of real questions (those to which you do not already know the answer).

b) **Dimension goals:** Student raises questions independently and perseveres in exploring them. Acquisition of capacity to initiate behavior of questioning on one's own.

c) **Possible sources of relevant evidence:** Observation/records of class talk and student/teacher or student/student exchange. Note that same evidence can inform different dimensions.

d) **Classroom teachers' responses to dimensions:**

- basis for learning
- starts with question
- investigating
- could end with questions
- learners' question
- teacher models questioning to some extent
- uses learners' experiences to investigate
- students finding out what?
- Focus -- How does what I know relate to what I want to learn?

3. INTERACTION

a) **Definition**: Talking, working, problem solving with other students. Interacting with experience means not simply receiving information but posing problems responsively. Has an affective dimension.

b) **Dimension goals**: Teacher provides opportunities for students to interact with teacher, other students, and materials. Modification of speech. Teacher monitors student progress, checks for comprehension and indicators of quality interaction and provides immediate feedback.

c) **Possible sources of relevant evidence**: Classroom observation and record of class talk student to teacher/student to student, etc.

d) **Classroom teachers' responses to dimensions:**

- verbal/communication
- learning by interaction
- learners interact
- oral and written communication -- using PIX to communicate
- student to student
- teacher to student -- teacher question
- teacher models inquiry to students
- expression of "ideas" -- oral, written, pictorially, experiments
- teacher to teacher -- planning
- sharing

4. TRANSFORMATION

a) **Definition**: Change in self perception. Synthesis of learning in other dimensions into transformed self-image. From recipient or deliverer of information or knowledge to generator of information or knowledge. Transformation is self directed.

b) **Dimension goals**: Teacher sees self as learner. Student sees self as teacher. Student and teacher see themselves as scientists. Teacher sees self as contributor to student's construction of own understandings; as facilitator rather than lecturer. Teacher and student realize: "It's okay for me not to know the answer."

Outside of classroom teachers may help other teachers to understand inquiry based active learning--may even become change-agents on the policy level, e.g., may stand up and speak out at a conference.

c) **Possible sources of relevant evidence:** For teachers and students, self-report; report of other teachers and individuals who encounter students and teachers in other settings. Journal/log entries. Interview responses.

d) **Classroom teachers' responses to dimensions:**

- teacher as facilitator instead of transmitter
- Ah Hah! is the heart of project
- increases capacity of teacher and student
- thinking skills promoted
- kids take responsibility
- kids' attitude → "Yes, I can."
- kids as scientists
- kids' awareness of how they learn -- "Metacognitive awareness"
- teacher transformation
- kids' goals for future

V. Suggestions for Work with Teachers

1. **Vis-a-vis next meeting:** It was suggested that a similar forum with the participating Prism teachers would contribute to process of identifying relevant dimensions. That is to say, participating teachers would review proposed relevant dimensions discussing for each: definition, dimension goals, and possible sources of relevant evidence. Their contributions can be compared and constructively synthesized with previous work. Group can consider validity of proposed dimensions and/or usefulness of adding, subtracting or replacing any.

2. **Vis-a-vis ongoing data collection:** It was suggested that a useful vehicle with which to scaffold data collection by teachers and Prism team might be portfolios and/or including journals compartmentalized according to dimension. A data portfolio might be set aside as a literal portfolio with folders within, each marked for a separate dimension. As rich student or teacher work or audio tape etc., emerges, it can be logged in the appropriate folder. Similarly a journal sectioned off by dimension might provide a useful scaffold for recording reflection in and around the various dimensions or even jotting down conversations overheard or observations noted. It was suggested that participating Prism facilitators could keep parallel folios and journals along with teachers and that at reflection sessions the data could be collaboratively reviewed with an eye to recurring themes etc.

GOOD LUCK

January 24, 1994

To: PRISM Team
From: Jessica Davis
Re: Our last meeting in New Haven
Date: January 24, 1994

I enjoyed our session tremendously and am especially pleased to have had the chance to have glimpsed a bit of the PRISM program in action. Here, as promised, is a summary of the discussion regarding organizing evidence over time or.....

The Compilation of a Working Processfolio
collected in order to document educational effectiveness
and inform
The Five Portraits of PRISM Sites

Overall:

•We stressed the importance of entries collected over time, so that when possible, comparisons could be drawn between early and more developed efforts within and across dimensions.

•We discussed the use of the tape recorder not only as a good source for entries, but also as a possible positive intervention in classroom activity. Students may rise to the occasion of documenting questions, interactions, etceteras and benefit from listening to tapes and working towards progress documented therein. It was suggested that students might be able to take tape recorders home and transcribe discussions about their work in science with parents and siblings etc.

•In considering the use of drawing as a source of documenting both understanding and development, it was suggested that children this age often enjoy drawing on graph paper which helps scaffold them in their attempts at realistic representation. It was also thought that graph paper might make it easier for children to develop their own charts for recording observations and results.

• The importance of setting the physical stage for context in a portrait was mentioned. There are very different physical realities between the PRISM classrooms at the Columbus and Clinton schools and a reader would benefit from having the stage set, e.g. at Clinton, noting the high yellow cracked ceilings that loom above, beyond eye level of the students. Are the paper collages hung at a lower level designed to transform the students' view upwards?

Compilation:

As a touchstone for the exchange, we posited a physical processfolio in the form of a manila envelope in which file folders were contained, one for each PRISM dimension: 1) Inquiry; 2) Reflection; 3) Interaction; and 4)

Transformation. What follows are suggestions for possible entries (synthesized from teacher contributions to earlier memo) that might be filed within each section. Interspersed in italics are observations from field notes from our brief site visits to the Columbus and Clinton schools as mentioned in our session. Hope the abbreviated form is intelligible.....

1) INQUIRY (Examples of possible entries)

1. Records of teacher questions over time:
   Written or taped teacher questions.
   Written or taped journal entries as reflections on extent to which recorded questions model process for students.

2. Evidence of student questions over time:
   Written or taped student questions over time—early and later examples—including taped or written journal entries as teacher and/or student reflection on evidenced development.

3. Examples (written or recorded) of new questions as endpoint or result of inquiry based learning (rather than solutions or right answers): new questions that have grown out of pursuit of original questions rather than a rush for answers.

4. Written or taped examples of students and teachers posing some form of either or both of the following questions:
   "What do I want to learn?" and
   "How does what I know relate to what I want to learn?"

2) REFLECTION (Examples of possible entries)

1. Descriptions of teacher "set-ups" of materials with evidence of reflection (as journal entries written or taped) on process and how it is being modeled in presentation of materials. Other documentation of this process might be in the form of lesson plans.

2. Evidence of student "comparisons" of discrepant events:
   Taped discussions
   Samples of student writing
   Samples of student drawing as it is imprinted with such reflection.

The boy at Clinton who collected the microscope from out of the PRISM closet in order to compare both sides of the coin on which drops of water had been collected in the experiment. Considering the convex surfaces of the face on one side with the concave indentations surrounding the "palace" on the other, he made many close observations that could have been taped and recorded as evidence of his developing skills of observation and reflection: his discovery of the relationship between the differences in surfaces and their respective responsibility for holding more or less liquid.

3. Taped discussion, student writing, pre and post experiment drawings which document reflection as *internal inquiry*, evidence of reflection on expectations vs. observations, etc.

4. Evidence of reflection as *self-assessment*: journal entries, taped recordings of student discussion of work over time—perhaps as accompanying student work included in folio: drawings, write-ups, etc.

The tapes of the interviews of children at Clinton by Margaret and Wendy will offer evidence of the students' reflection on their learning in a particular experiment. It was also pointed out that the teacher models such self-assessment by sharing with students her dissatisfaction with the form she provided for recording observations and her ideas for improving the format as well as her explanation of why she provided it. Teachers modeling how mistakes can be generative may provide a powerful lesson to students in reflection as self-assessment.

3) INTERACTION (Examples of possible entries)

1. Audio taped interactions of student to student, student to teacher, and student to other individuals (e.g. discourse at home?) *I think of the girl at the Columbus School who turned to her classmate ,"Oh I won't help you again!" It would be interesting to have a record of what the "helping" had been about*

2. Samples of collaborative work: e.g. student/student writing, drawing. science projects with taped or written reflection on how examples evidence interactive skills etc.

3. Examples of student/teacher interaction over work and journal entry reflection (taped or written) on how interaction affected student work.

4. Teacher/teacher collaboration —planning: evidence of interactive exchanges in memos or lesson plans or journal entries taped or written.

5. Examples of student/student interaction in letters or PIX.

I think of the boy observed at the Columbus School who was apparently disinterested in the teacher's questioning. Instead of participating in the discussion, he was drawing cartoon criminals all over his page with a WANTED sign under their faces. When asked if he could draw the three different sized containers of water that were part of the experiment, he rose to the occasion doing three very detailed drawings in good perspective. When asked which one of the containers he had portrayed would freeze first, he pointed to the middle one and then, looking carefully at his other two drawings, revised his answer. "No!" he decided, "it's this one." he said pointing to the drawing of the low flat container. "Porqué?" And he answered carefully, not taking his eyes off the drawing with which he was interacting. Pointing to the low flat surface, he explained, "because the air gets to it all the fastest."

4) TRANSFORMATION (Examples of possible entries)

1. Evidence of teacher transformation to teacher as learner:
   Examples (taped exchanges) of teacher facilitating learning as opposed to filling empty vessels with teacher reflection (taped or written) explaining how example demonstrates facilitation.
   Student assignments or class tasks, material set-ups, with reflection as journal entries (taped or written) considering extent to which stimuli is presented as problem posing rather than answer seeking, etc.

2. Examples of teacher questions (what teacher wants to know etc.) from Inquiry folder may serve as example of teacher transformation with reflection that addresses that change.

3. Student transformation to self teacher: examples of students taking responsibility for their own learning (taped or written evidence). *I think here of the little girl at the Columbus School who checked for the proper spelling of "agua" from an earlier page in which she had entered it (as opposed to asking someone) or the boy who independently sought out more general questions of temperature difference (from water in container to air around container to the radiator itself) when the class was addressing the question of the effects of varying amounts of water on the time in which it would freeze.*

4. Student transformation to scientist: evidence of scientist-like behavior on part of students. Recorded observations of students observing phenomena in experimentation or comparison of student drawings over time indicating increase in attention to detail in depiction. *At the Columbus School, students were asked to think of other liquids they could observe turning to ice (coke, detergent, etc.) and one boy added provocatively, "bleach."*

5. An increase in metacognitive behavior: reflection on self-change on the part of teachers and/or students in oral discussion or written journal entries or in taped interviews.

6. Student articulation of goals for future learning as evidenced in writing or interview—serving to demonstrate transformation in student attitude, etc.

I think of José at the Columbus School who offered a spontaneous account of a 16 year old boy who had come "to do science with us" and took "vinegar and soap for the dishes" and a glove and made the fingers of the glove "swell up." José explained that he recreated the science activities at home with his family—with his brothers. A tape of this account (or a written account taken as he talked) would be great evidence for reflection and transformation as well as interaction. Letting José take the tape recorder home to record one of his sessions with his brothers would not only provide a rich folio entry, it would also let José know how much his independent science activities were valued.